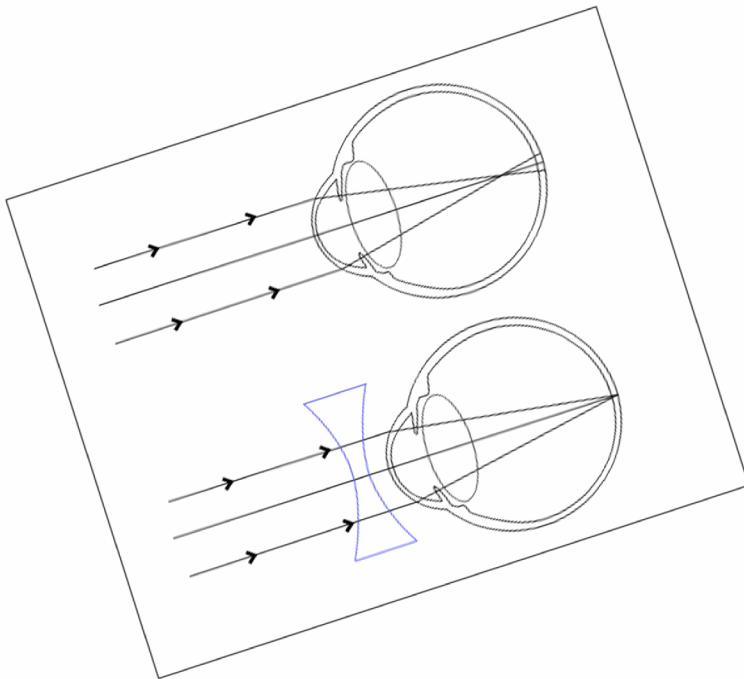
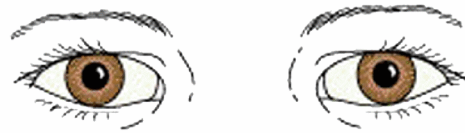


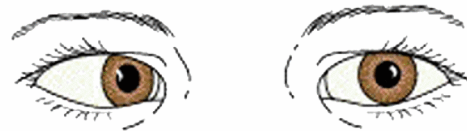
Ophthalmology Cases With Answers



Normal



Crossed Eyes
(Strabismus)



One Vision...One Mission

ALL TEAM



1. A 14 year-old boy is seen for a physical examination at school. He admits to difficulty in reading the blackboard but not in reading textbooks. He does not wear glasses. You record VA as OD 6/36, pinhole 6/9; and OS 6/36, pinhole 6/9.

N.B: OD means VA in Rt eye, OS: VA in Lt eye, Pinhole: narrow the effective pupillary aperture and thereby minimize the blurring induced by a refractive error.

- **What is your diagnosis? Would you manage or refer this patient?**

Answer

The combination of decreased distance vision with preserved near vision is typical of myopia, which often becomes symptomatic during adolescence. Presumptive evidence of refractive error is provided by the marked improvement in visual acuity that occurs with the use of the pinhole. Note that visual acuity with pinhole frequently does not reach 6/6. The patient should be referred to an ophthalmologist as a regular rather than an urgent consultation.

2. A 78 year-old woman is seen for an annual physical examination and complains of mild difficulty in reading and seeing street signs. You record OD 6/24, no improvement with pinhole; and OS 6/18, no improvement with pinhole. Upon direct ophthalmoscopy, you note a dullness of the red reflex and you have difficulty seeing details in both eyes.

- **What is your diagnosis? Would you manage or refer this patient?**

Answer

Cataract is a common cause of painless progressive loss of vision in older individuals. Her complaints about her visual ability are an indication for referral to an ophthalmologist for evaluation for possible cataract surgery.

3. A 40 year-old man is seen for an annual executive physical. He has no complaints and does not wear glasses. You record VA as OD 6/6; and OS 6/36, no improvement with pinhole. During examination, the patient revealed that he has been aware since childhood that left eye was a so-called lazy eye-in other words, that he suffered from amblyopia.

- **Would you refer this patient?**

Answer

Referral is not indicated since the cause of decreased vision is established and progressive loss is not occurring. Note that this healthy individual has better than 6/6 acuity in his right eye.

4. A 50 year-old man visits your office because he noted decreased visual acuity in the right eye the preceding day while accidentally occluding his left eye. When his present glasses were prescribed 2 years ago, his vision was equal in both eyes. You record VA as OD 6/18, no improvement with pinhole; and OS 6/6. Upon ophthalmoscopy, no abnormalities are detected.

- **What, if any, is your diagnosis? Would you manage or refer this patient?**

Answer

The patient has an unexplained loss of vision of unknown duration in one eye. An unexplained decrease in vision in one or both eyes requires referral to an ophthalmologist, because it may indicate occult disease of the eyes or central nervous system that is not detectable by examination methods available to the primary care physician.

In this case, the patient's decreased vision was due to a macular disturbance detectable only by more precise methods of examination (e.g., special lenses and fluorescein angiography).

5. A 55 year-old man, wearing goggles, was sawing wood in his garage shop. He removed the goggles to clean up and, while sweeping up small wood chips, had the sudden onset of a foreign-body sensation in his right eye. The irritation was not relieved with artificial tears, and it intensified with every blink. His wife rushed him to their family doctor for emergency treatment. The physician was able to examine him after placing a topical anesthetic in the right eye. Visual acuity in the right eye was 6/24. Fluorescein staining revealed multiple vertical linear abrasions of the cornea.

A- Explain the clinical findings.

B- What further examination is required, and how is it performed?

Answer

- A-** By history, this man has been exposed to small particles that could abrade his eye. The vertical linear abrasions in conjunction with the feeling of irritation with each blink imply the presence of a foreign body under the upper lid.
- B-** Eversion of the upper lid will expose the foreign body, which can then be removed using a cotton-tipped applicator stick.
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6. A 58 year-old woman complains of a sudden shower of dust-like particles floating before her right eye. You record VA as 6/6 in each eye upon dilated ophthalmoscopy, you see a normal. Your diagnosis is of a possible retinal tear, with the danger of retinal detachment

➤ **What is your course of action?**

Answer

Prompt ophthalmologic consultation. A sudden shower of floaters may indicate red blood cells in the vitreous due to a retinal tear. Floaters may be visible to the patient but not to the ophthalmoscopist.

Because the retina has no sensitivity to pain and is, in fact, limited to the sensation of light, the patient may report flashes of light as the retina tears or detaches. Retinal tears usually are located in the far periphery of the retina and may easily elude detection. Symptoms alone indicate the need for referral.

7. A 67 year-old man experienced sudden loss of vision in the left eye 3 hours ago. You record VA as OD 6/6 and OS no light perception. The right pupil responds to light directly but not consensually. The left pupil responds to light consensually but not directly. Dilated fundus examination of the right eye is normal. The left eye shows a white, opacified retina, a cherry-red spot in the macula, and sluggish retinal circulation. You diagnose a central retinal artery occlusion.

➤ **What is the proper management?**

Answer

You use the heel of your hand to apply pressure to the affected eye, pressing and releasing several times, in the hope that the induced alterations of intraocular pressure may dislodge an embolus. You seek ophthalmologic consultation and undertake a prompt search for the cause of this vascular event.

Because the retina is neural tissue and survives complete circulatory deprivation poorly, the prognosis for recovery of useful vision in the affected eye is not good. Probably as important is the detection of underlying disease (such as giant-cell arteritis) or a site of embolus formation (such as carotid atheroma) that might lead to future vascular occlusions.

8. A 78 year-old man has recently noticed poor vision in the right eye. He thinks the onset was rather sudden. He has been otherwise healthy but has lost 5 pounds over the last month and thinks he has "less energy." He also has noticed a headache on the right side over the last several days. Your examination reveals a visual acuity 6/24 of on the right and 6/9 on the left. The right pupil seems suspicious for an afferent pupillary defect but is difficult to interpret. The optic nerve looks swollen on the right.

➤ **What is your course of action?**

Answer

The patient has giant-cell arteritis but does not have all of the classic symptoms and signs. Your index of suspicion should be high in this patient because of his reduced vision, possible afferent papillary defect, headache, and swollen optic nerve. Obtain a STAT sedimentation rate and refer the patient to an ophthalmologist immediately.

High-dose systemic corticosteroids may be needed to preserve vision and prevent other systemic complications.

9. During a thorough physical examination of a 38 year-old male patient, you record intraocular pressure of 20 mmHg in the right eye and 24 mmHg in the left eye.

➤ **Based on these findings, which of the following represents a reasonable course of action on your part?**

- Explain to the patient that he has glaucoma and that you want to recheck his intraocular pressure in 3 months.
- Evaluate the optic discs carefully and, if they are normal, recheck the patient in 6 to 12 months.
- Refer the patient to an ophthalmologist.
- Inquire about a family history of glaucoma and, if there is none, reassure the patient that his intraocular pressure is probably in the upper range of normal.

Answer

c. Elevated intraocular pressure alone is not a definite indication of glaucoma. It would be correct to tell this patient that his intraocular pressure is slightly elevated on this one occasion. In tonometry screening, it is best to determine the pressure and act accordingly rather than make decisions regarding a definitive diagnosis of glaucoma and a decision on management. Thus, the correct approach in this case is to refer the patient to an ophthalmologist, because pressure of 22 mmHg or higher is statistically abnormal.

The ophthalmologist may decide merely to observe the patient without treatment, but this decision should be left to the ophthalmologist, who should communicate this to the referring physician.

It is good to know whether the optic discs are normal, but once you find an elevated pressure, your next move should be referral. On the other hand, in situations where you find normal pressure but questionable optic discs, remember that glaucoma still could exist and that referral still may be indicated. Finally, although glaucoma has some hereditary aspects, this should have no bearing in a case in which you find elevated pressure. However, should you have a patient with a strong positive family history of glaucoma; it may be wise to suggest that the patient obtain an ophthalmologist's evaluation despite your finding normal pressure.

10. A retired patient of yours is developing the nuclear sclerotic form of cataract, and his visual acuity has decreased to OD 6/9 and OS 6/12. The only time his vision bothers him is in a dark restaurant, where he has some difficulty reading the menu. Friends have told him about a doctor who will operate with a laser to remove his cataract without risk and who will do it for free. He asks your advice.

➤ **What do you tell him?**

- a. If it's free and he really is a doctor, then go ahead.
- b. Tell him that a laser is not used to remove cataracts, but he should go ahead anyway.
- c. Advise that
 - 1) The indications to remove a cataract are that it endangers the health of the eye or keeps the patient from doing what he needs and wants to do;
 - 2) Lasers are not used to remove cataracts
 - 3) No surgery is free or without risk. The disability of decreased vision must warrant the risks inherent in surgery.

Answer

c. Advise that

- 1) The indications to remove a cataract are that it endangers the health of the eye or keeps the patient from doing what he needs and wants to do;**
- 2) Lasers are not used to remove cataracts**
- 3) No surgery is free or without risk. The disability of decreased vision must warrant the risks inherent in surgery.**

11. A 76 year-old man has noted visual distortion over the past week. His concern increased when he discovered that the distortion was in the right eye only. Straight lines viewed through his left eye remained straight, but they appeared to dip down in the center when viewed with his right eye only. Visual acuity testing revealed 6/18 OD, 6/6 OS.

- A- What further tests will help determine the source of the patient's visual loss?**
- B- What technique is used by ophthalmologists to identify neovascularization in consideration for laser treatment?**
- C- What percentage of patients with age-related macular degeneration develops subretinal neovascularization?**

Answer

- A- Amsler grid testing will document the patient's symptoms of metamorphopsia. Dilated fundus examination may reveal retinal drusen, retinal hemorrhages secondary to subretinal neovascular membranes, or retinal pigment epithelial atrophy as a manifestation of age-related macular degeneration.**
- B- Fluorescein angiography is used to document neovascularization.**
- C- Twenty percent of patients with age-related macular degeneration develop subretinal neovascularization.**

12. A 23 year-old school teacher complains that her right eye is red and irritated. You note moderate injection of the larger conjunctival vessels, watery discharge, and a palpable preauricular lymph node.

- A- From this information alone, what tentative diagnosis would you make?**

B- Again based on the above information, which of the following symptoms or facts might be elicited by careful history-taking?

- 1) Blurred vision.
- 2) Sore throat.
- 3) Exposure to children with colds.
- 4) Itching.

C- Which of the following are also likely findings in this case of viral conjunctivitis?

- 1) A small pupil in the right eye.
- 2) Lymphocytes in a smear of conjunctival scrapings.
- 3) Keratic precipitates.

D- Management by a primary care physician should consist of which of the following?

- 1) Corticosteroid.
- 2) Broad-spectrum antibiotic.
- 3) Referral to an ophthalmologist.
- 4) Instruction to the patient to use cool compresses and stay home from school until the redness resolves.

Answer

A- The conjunctival injection and discharge suggest conjunctivitis. The serous nature of the discharge plus the preauricular adenopathy indicates that she has viral conjunctivitis.

B- 2 and 3. Sore throat often accompanies viral conjunctivitis; in such cases, a history of exposure to other individuals with upper respiratory tract infections can often be elicited. Blurred vision, a danger signal of serious ocular disease, is not a feature of simple conjunctivitis. Itching is a symptom of allergic, not viral, conjunctivitis.

C- 2. Lymphocytes are usually found in scrapings from eyes with viral conjunctivitis. A small pupil and keratic precipitates are signs of iritis.

D- 4. Because the disease is contagious, the patient should be instructed to remain home from work. There is no specific medicinal treatment for viral conjunctivitis. Corticosteroids are contraindicated.

13. A man returned recently from an African journey. During his trip he had three episodes of blurring and pain in his left eye; each episode lasted about 2 hours and was relieved by sleep. A few hours before consulting you, his symptoms recurred.

A- Which of the following signs convince you that the patient does not have conjunctivitis?

- 1) Visual acuity of in the left eye.
- 2) Conjunctival injection.
- 3) Ciliary flush.
- 4) Absence of exudates.

- B- You note a diffuse haziness of the patient's left cornea. What is the most likely diagnosis?**
- C- You seek confirmatory data for your tentative diagnosis. What do you expect the following tests to show if your diagnosis is correct?**
- 1) Estimation of anterior chamber depth: deep or shallow?
 - 2) Determination of pupil diameter: large, middilated, or small?
 - 3) Measurement of intraocular pressure: high or low?
- D- Your management should be which of the following?**
- 1) Corticosteroid eye drops.
 - 2) Advice to see an ophthalmologist the next day.
 - 3) A telephone request to an ophthalmologist for immediate examination.

Answer

- A- 1 and 3. Reduced visual acuity, as well as ciliary flush, often signals ocular disease more serious than conjunctivitis.**
- B- Diffuse haziness of the cornea is usually due to edema. This and the history of recurrent attacks relieved by sleep suggest the diagnosis of acute angle-closure glaucoma.**
- C- In angle-closure glaucoma, the anterior chamber is shallow, the pupil is usually middilated, and the intraocular pressure is high.**
- D- 3. Angle-closure glaucoma requires emergency treatment to lower the intraocular pressure. The patient should be referred immediately to an ophthalmologist. If an ophthalmologist is not immediately available, you may begin topical pilocarpine hydrochloride 1% or a topical beta-adrenergic blocker, and a systemic carbonic anhydrase inhibitor.**
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14. After working in his garden, a 57 year-old man complains of moderate discomfort and redness in his right eye. You note a visual acuity of 6/9 in the right eye and 6/6 in the left eye. The right eye has mild hyperemia of the conjunctival vessels; the right cornea appears clear to penlight examination. You diagnose a probable allergy to pollen and advise the patient to use topical dexamethasone sodium phosphate 0.1% for 3 days.

- A- Give two reasons why your diagnosis of allergic conjunctivitis is unlikely to be correct.**
- B- What other diagnostic techniques should you have performed to be certain that the cornea is normal?**
- C- Is there any hazard in your prescribed course of treatment? Explain.**

Answer

- A-** Unless the patient has always had weaker vision in his right eye, this finding should alert you to the possibility of a more serious inflammation, such as iritis, keratitis, or glaucoma. Also, the patient did not complain of itching, which you might expect in an allergic reaction.
 - B-** If the patient has an early herpes simplex keratitis or if his cornea has been scratched by a twig, the epithelial disruption might not be easily seen during a penlight examination. However, it most likely would be rendered visible by fluorescein staining of the cornea.
 - C-** Yes. The virulence of both herpes simplex and fungal infections, which can result from trauma involving organic material, is markedly potentiated by the application of topical corticosteroids to the eye.
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15. A 38 year-old woman complains of a 3-day history of a red, tender right eyelid. Physical examination reveals a tender nodule of the right lower eyelid with minimal injection of the inferior conjunctiva.

- A-** Which of the following would constitute appropriate management by the primary care physician? (More than one course of action may be possible.)
 - 1) Hot compresses.
 - 2) Broad-spectrum systemic antibiotics.
 - 3) Topical antibiotics.
 - 4) Immediate surgical incision and drainage to prevent cellulites.
- B-** If the patient reports she has had numerous nodules in this same area over the last 5 years, how should the primary care physician change the management plan?

Answer

- A-** 1 and 3. The patient has a sty. Because she has only had symptoms for 3 days and the lesion is tender to touch, she would benefit from hot compresses. Topical antibiotic ointment might benefit a small percentage of patients. Incision and drainage is indicated only when lesions do not resolve spontaneously or with medical therapy. Usually surgical intervention occurs only after the lesion has been present for several weeks. Systemic antibiotics are not indicated.
- B-** A persistent or recurring lid mass should undergo biopsy to rule out an eyelid malignancy. Referral to an ophthalmologist is indicated.

16. Your neighbor, a 43 year-old woman, is cleaning her swimming pool. While pouring some concentrated algicide into the pool, a large dollop of this solution splashes into her right eye. You are mowing your lawn when you hear her screams. You come to her aid less than 30 seconds after the injury.

➤ **Which of the following should you do first?**

- a. Bundle her into your car and speed off for the nearest emergency center.
- b. Run back home to get your medical bag where you keep a squeeze bottle of irrigating solution that you can use to flush out her eye.
- c. Run back to your study to look up the specific antidote for algicide.
- d. Carefully examine her eye for evidence of ocular hyperemia.
- e. Dunk her head into the swimming pool, instructing her to hold her eyes open to flush out the chemical.

Answer

e. This is one of the few true emergencies of all the ocular injuries that you must know. Early and copious irrigation with whatever source of water is handy is the right approach to this problem. Even with prompt treatment, serious ocular injuries and visual damage may result, depending on the offending chemical. Time is of the essence. Do not resort to methods that cause delay.

17. You are on duty in the emergency center when an 18 year-old high school student comes in because of pain, tearing, sensitivity to light, and blurred vision in his right eye. His symptoms began sometime that afternoon. Earlier, he had been working on his car and he remembers something flying into his right eye while he was trying to knock a rivet off the chassis with a hammer and chisel. You examine his eye and take visual acuity measurements. You determine that visual acuity is 6/18 in the right eye and 6/6 in the left eye. There is some conjunctival hyperemia. The pupil of the right eye seems to be peaked and pointing to the 7-o'clock position of the There is a small, dark, slightly elevated body at the 7-o'clock position of the limbus. You cannot see fundus details of the right eye, but the left eye appears normal.

➤ **Which of the following would be the appropriate initial management for this situation?**

- a. Irrigation of the limbal foreign body.
- b. Application of a protective shield.
- c. Removal of the limbal foreign body with a cotton-tipped applicator.
- d. Removal of the limbal foreign body using forceps.
- e. A prescription for topical anesthetic (eg, proparacaine 0.5%) to relieve the patient's symptoms, with strict instructions that he return to see you if his blurred vision continues into the week.

Answer

b. Any patient whose recent activities involve striking metal on metal should be suspected of having a foreign body, even with minimal signs and symptoms. However, the case illustrated includes a giveaway sign, namely, peaking of the pupil toward the 7-o'clock position. At that position, the dark body is likely to be iris or ciliary body rather than a foreign body. This indicates a penetrating ocular injury, and the patient should be protected from further eye trauma by a protective shield. A CT scan will confirm the diagnosis of ocular or orbital foreign body. The patient should be considered an urgent referral to an ophthalmologist.

18. While cutting his roses, a neighbor develops a sudden pain in his left eye. Inspection is limited because his eyes are closed, but nothing is visible on external examination.

A- What do you think might have happened?

B- What steps would you need to take to assess and treat this problem?

Answer

A- Possibilities include a foreign body on the eye or under the lid; a superficial abrasion; or, less likely but still possible, perforation by a thorn.

B-

- 1) Open the lids gently; never force them open, and never apply pressure to the globe if perforation is suspected. Instill a drop of topical anesthetic, if necessary, to facilitate examination.**
 - 2) Inspect the cornea and the sclera for a foreign body or possible perforation.**
 - 3) Evert the lids to look for a foreign body, unless perforation is suspected.**
 - 4) Remove the foreign body by irrigation or with a cotton-tipped applicator.**
 - 5) Act on any indications for drops, ointment or patching.**
 - 6) If by history a possibility of ocular penetration exists, referral to an ophthalmologist is indicated. Clinical findings in such cases can be very subtle. Ocular penetration with vegetable matter such as a thorn carries not only the usual risks of ocular penetration (ie, endophthalmitis, cataract, and corneal scar) but also the possibility of a fungal infection.**
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19. While you are on duty in the emergency center, a patient is brought in who has been involved in a car accident. His face is bloody, especially around the eyes. His history is unclear.

- A- What would you do? What would you avoid?**
B- While cleansing, you find a cut in the eyelid. It seems easy to stitch, but the lids are swollen and the patient cannot open his eye. What next? Do you stitch the lid?
C- If the eye is normal, how should you analyze the problem of the lid laceration?

Answer

- A- Cleanse carefully. Avoid pressure of any kind on the eye.**
B- First, inspect the eye for possible perforation. Because the lid laceration is not an emergency, stitching is not immediately necessary.
C- The appropriate choice of treatment depends on the level of damage. If only the skin is involved, you may be able to stitch the lid. If the laceration is full-thickness or involves the lid margin, referral to an ophthalmologist is preferred. Any involvement of the canaliculi requires exquisite repair in order to avoid a tearing problem for the rest of the patient's life; referral to an ophthalmologist is mandatory.
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20. A 25 year-old man visits the emergency room complaining of decreased vision and pain in his right eye after being involved in a fist fight. Although he has edema and ecchymosis of the eyelids, you are able to examine his eye. His visual acuity is 6/24 OD and 6/6 OS, and his pupils are round and reactive. However, the right pupil is sluggish, and shining a light in either eye causes pain in his right eye. He has no restriction of motility. On examination of the anterior segment, you notice a diffuse haze in the anterior chamber and early layering of blood inferiorly. Direct ophthalmoscopy is difficult, but the central retina appears flat without hemorrhages.

- **Which of the following would be the most appropriate treatment?**
- a. Instill antibiotic ointment and cycloplegic drops, apply a pressure patch, and have the patient follow up with an ophthalmologist in a few days.
 - b. Prescribe steroid drops and cycloplegic drops, and tell the patient to keep his head elevated at all times.
 - c. Immediately refer the patient to an ophthalmologist to rule out ruptured globe or increased intraocular pressure.

Answer

c. Although option b may represent appropriate treatment for hyphema, the patient needs to be adequately evaluated for a ruptured globe. The periphery of the retina needs to be evaluated closely. Option a represents treatment for corneal abrasion, not hyphema.

21. A 3 year-old boy is brought to you by his mother, who tells you that she suspects his right eye is not straight.

- **What steps would you take to determine if a significant problem is present?**

Answer

- **Visual acuity testing should be attempted using the tumbling E chart or a picture card, with each eye alternately covered by an adhesive patch. A difference in visual acuity between the eyes or decreased vision in both eyes is significant.**
 - **Test the alignment of the eyes by evaluating the corneal light reflex. Then proceed to the cover test. Unequal positioning of the light reflex or movement of the uncovered eye to pick up the fixation would suggest a misalignment of the eyes.**
 - **Perform an ophthalmoscopic examination, preferably through dilated pupils, to determine if there is any intraocular basis for visual loss, such as cataract, retinoblastoma or a retinal abnormality.**
 - **If visual acuity is asymmetric or if there is a suspicion of intraocular disease, the patient should be referred for an urgent ophthalmologic evaluation. If visual acuity and the fundus examination are normal but strabismus is suspected because of other examination findings or patient history, a nonurgent referral should be made.**
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22. A family has just moved into your area and the mother brings her 6 month-old baby to your family practice office for a routine checkup. She mentions that the child's grandfather has noted that in several photographs the baby's left eye appears crossed. He is adamant in his observation and feels that "something should be done." The mother has felt that, at times, the eye has appeared crossed, but the baby's father has not observed this phenomenon.

- **How should you proceed?**

Answer

- **Inquire about any family history of strabismus or amblyopia and evaluate for the presence of epicanthus. Place your hand in front of one eye and then the other to see if the child exhibits displeasure.**
- **Observe the alignment of the child's eyes as well as extraocular movements if possible. Use a penlight to assess the position of the corneal light reflex.**
- **Examination reveals that significant lid folds are present. The corneal light reflex is the same in each eye, and full extraocular movements are seen in all cardinal fields of gaze. Although in this case the appearance of a crossed eye is probably the result of epicanthus, continued observation on the next visit is indicated.**

- Remember that strabismus and amblyopia can occur in a patient with epicanthus, and the strabismus may be intermittent. Any suspected abnormality should be referred to an ophthalmologist.
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23. A 2 year-old boy is brought to your office because his mother has noticed that over the past 2 weeks his right eye has deviated inward during periods of fatigue. On the previous evening, the boy's father claimed to have noted a white reflex in the child's right eye.

➤ How should you proceed?

Answer

- Show the child a toy and cover his left eye with your hand; evaluate his response. Cover his right eye to compare his response.
 - Evaluate the corneal light reflex and perform the cover test. In particular, note whether an abnormal response is elicited on covering one eye.
 - Test the pupillary light reflexes. Perform an ophthalmoscopic examination, preferably through a dilated pupil, to assess the red reflex and observe for organic pathology.
 - Examination reveals equal pupillary light reflexes. A white reflex is noted on ophthalmoscopic examination of the right eye as compared with the left. No detail can be seen in the right fundus. Your findings indicate the need for an urgent referral. Following ophthalmologic consultation, the esotropia in this child was diagnosed as secondary to a retinoblastoma.
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24. A 54 year-old man has early cataracts in both eyes. With glasses, the right eye cannot be corrected to better than 6/60, whereas with the left eye he can read the 6/12 line with best correction. The amount of cataract is exactly the same in each eye. Examination of the optic disc and macula, pupillary reaction, color vision, and retinal blood vessels proved entirely normal in each eye. However, the right eye appears to be turned slightly inward when you evaluate the corneal light reflex, and the patient has not experienced diplopia. Additional questioning reveals that the patient wore a patch over one eye as a child.

➤ Why would information concerning his childhood ocular condition be relevant in this situation?

Answer

The poor vision in the right eye may be due to a long-standing amblyopia. If this is the case, an ophthalmologist will conclude that removal of the cataract would result in vision only as good as that during the adolescent years and surgery would probably not be recommended.

25. A 4 year-old boy with attention-deficit disorder comes to your office for his routine preschool physical examination. Your nurse tests his visual acuity with the picture card and obtains 6/9 vision on the right. During testing of the left eye the patient loses attention and refuses to cooperate further with testing.

➤ **What course of action should you take?**

Answer

Often children become uncooperative with visual acuity testing due to poor vision in the eye being tested. This is sometimes misinterpreted as a behavioral rather than an ocular issue. This patient can return on another day to have the left eye tested first, with the right eye covered by an adhesive patch. If visual acuity measurement is still unsuccessful, the patient should be referred to an ophthalmologist for evaluation.

26. A 4 year-old girl is brought to your office by her mother, who says that she sees her daughter's right eye "drifting." You test the patient's vision, which is 6/6 in each eye. There is no epicanthus. The corneal light test shows no deviation, and the cover test fails to reveal strabismus.

➤ **What is your next step?**

Answer

Strabismus can be intermittent. Intermittent esodeviations are usually early manifestations of a constant deviation and may be difficult to detect during the early stages. Intermittent exodeviations are more pronounced when the patient is tired or sick but can be easily missed. If the patient has a reliable history of strabismus but you are unable to detect the deviation, referral to an ophthalmologist is recommended.

27. A mother reports that her 1 year-old child is sensitive to light and his right eye looks larger than the left. On examination you note that although the child's right eye does look larger, the pupillary reactions are equal in both eyes, the corneas are clear, and there is a good red reflex in each eye.

➤ **What should you tell the mother?**

- a. Do not worry, the will "grow into" eyes.
- b. Return in 1 month for a reexamination.
- c. Take the child to an ophthalmologist on my referral.
- d. This is probably a cancer of the right eye, and you should take the child to an oncologist on my referral.

Answer

c. Children can have glaucoma, which causes buphthalmos, or enlargement of one or both eyes. Although glaucoma may be associated with increased tearing, sensitivity to light, and a hazy or white cornea, the only sign of glaucoma in some children may be enlargement of the eye or eyes. This child should be referred immediately to an ophthalmologist for diagnosis and management.

28. A 45 year-old woman comes to the emergency center because of severe left-sided headache and double vision that began the night before, immediately following vigorous exercise. As you examine her, she continues to complain of severe left-sided headache. Her neuro-ophthalmologic examination is normal, except that the left upper lid is ptotic; the left eye is deviated outward and fails to elevate, depress, or adduct normally; and the left pupil is dilated 3 mm more than the right and responds very poorly to light, both directly and consensually.

➤ **What is your differential diagnosis? How would you proceed with evaluation and management?**

Answer

The findings are those of left third-nerve palsy with involvement of the pupil. The features of this case—including the age and gender of the patient, the suddenness of onset, the accompanying headache, and the fact that onset occurred in conjunction with vigorous exercise—are presented to raise the issue of a possible berry aneurysm of the circle of Willis. All of the preceding factors are commonly observed in acutely expanding aneurysms arising at the junction of the internal carotid and posterior communicating arteries. Such an aneurysm is the most common cause of third-nerve palsy with pupillary involvement. Even though the patient may have no symptoms other than headache and those symptoms caused by the third-nerve palsy, an aneurysm must be suspected. This is one of the true ophthalmic emergencies. The management in this case calls for an immediate neurosurgical consultation.

In this situation, the pupil was dilated. If the same patient appeared with exactly the same findings except for a normal left pupil, the diagnosis and management would be different. Pupil-sparing third nerve palsy most likely is due to diabetes or some other microvascular obstruction causing ischemia of the core of the oculomotor nerve.

Therefore, pupil-sparing third-nerve palsy is not a neurosurgical emergency and the patient should be worked up for diabetes, giant-cell arteritis, syphilis, and other vascular disease. It is important to note that a third-nerve palsy can be considered pupil-sparing only if the palsy is complete and the pupil is totally normal.

29. A 25 year-old medical student suddenly complains of horizontal diplopia. Her eyes are straight when looking directly ahead, but when she attempts to look to the right or left, the adducting eye fails to move normally. However, when she is asked to look at the examiner's finger at a distance of 6 inches, both eyes converge normally. She also exhibits vertical nystagmus when she looks up.

- **What is the neuro-anatomic localization of this problem? What is the etiologic diagnosis?**

Answer

The description is that of bilateral internuclear ophthalmoplegia. The medial longitudinal fasciculi conduct impulses to those third cranial nerve nuclei essential for participation in horizontal gaze movements. Acute, bilateral impairment of function of the medial longitudinal fasciculi occurring in this age group is typical of multiple sclerosis.

30. A 32-year-old female geologist has noticed slowly progressive blurring of vision for about a month. An optometrist changed her prescription, but the new glasses were of minimal benefit. After the symptom had been present for 3 months, she visited her family doctor, who found nothing wrong and referred her to a neurologist. The neurologist could find no abnormality and suggested she might be suffering from stress. She has now come to the emergency center because her vision has become distressingly blurred. You conduct a basic eye examination and find the following: visual acuity in the left eye is 6/18 and does not improve with a pinhole lens; the swinging-flashlight test discloses a left relative afferent pupillary defect; a confrontation visual field test suggests a temporal defect in the left eye only; and ophthalmoscopy reveals mild pallor of the left optic disc.

- **What is the differential diagnosis? Is additional testing required at this time, or should the patient merely be observed further?**

Answer

The history of slowly progressive visual loss and the presence of a relative afferent pupillary defect are evidence of a left optic nerve lesion. Optic neuritis is a possibility, but it usually produces sudden onset of visual loss, with recovery after a few weeks or months. The history and the findings are strongly suggestive of a tumor compressing the left optic nerve. Detailed visual field testing will probably reveal a major field defect in the left eye and a normal field in the right eye. This localizes the lesion to the prechiasmal optic nerve, either in the orbit or in the brain. A CT scan or MRI with and without gadolinium would be the test to order next, with the expectation that it will show a meningioma or another kind of mass compressing the optic nerve.

31. A patient cannot see in the temporal visual field in either eye.

- Which one of the following findings is most likely to be associated with this defect?
- a. Tilted optic discs.
 - b. Pituitary tumor.
 - c. Neurofibromatosis.
 - d. Optic nerve toxicity.
 - e. Infarction.

Answer

b. The fact that the field loss respects the vertical meridian in each eye localizes the pathology to the optic chiasma. Pituitary tumor is the most common cause of a chiasmal syndrome. Tilted optic discs can produce temporal field loss, but the defects would extend only up to the blind spot and not to the vertical meridian. Neurofibromatosis can be associated with chiasmal glioma, but pituitary tumor is a more common association. This is not the picture of optic nerve toxicity, which is typically characterized by bilateral central scotomas with intact peripheral fields. Infarction rarely occurs in the chiasm.

32. A 64-year-old woman reports progressive onset of ptosis and diplopia over an 8-month period. On examination, the left eye is normal but the right eye reveals 4 mm of ptosis, limitation of eye movement in all directions, a 4-mm pupil that does not react to light or dilate in darkness, and loss of corneal sensation.

- Which of the following is the most likely diagnosis?
- a. Myasthenia gravis.
 - b. Graves' ophthalmopathy.
 - c. Intracavernous.
 - d. Aneurysm of the posterior communicating artery.
 - e. Glioma of the right midbrain.

Answer

c. The patient's findings can best be explained by involvement of the third, sixth, fifth, and sympathetic nerves. Fourth-nerve involvement cannot be determined from the description. A midilated pupil that does not react to light or dilate in darkness usually indicates impairment of both the parasympathetic and the sympathetic innervation of the pupil. This finding as well as the other findings can best be explained by a lesion in the cavernous sinus. Meningioma and internal carotid artery aneurysm are the most common causes, particularly with a history of slow progression. Myasthenia gravis and Graves' ophthalmopathy would not produce the pupillary or sensory findings noted in this patient. An aneurysm of the posterior communicating artery could produce a third-nerve palsy but would not be expected to produce the other findings. A midbrain lesion typically produces bilateral ptosis, if any, and could not explain the sensory findings.

33. An adult patient with a 10 year history of non-insulin-dependent diabetes comes to your office for the first time, having recently moved from another state. She tells you that she has never seen an ophthalmologist nor had a dilated ophthalmoscopic examination. Her visual acuity is normal, but on dilated fundus examination, you find neovascularization of the optic disc.

➤ **How do you manage this patient?**

Answer

Although this patient's visual acuity is normal, neovascularization of the optic disc is diagnostic of proliferative diabetic retinopathy, which places this patient at high risk for developing marked visual loss. She should be referred immediately to an ophthalmologist for examination and treatment. Pan retinal laser photocoagulation surgery can be initiated to reverse the course of the neovascularization and reduce the risk of serious visual loss.

34. A 45 year-old man comes to your office complaining of headaches and nosebleeds. His blood pressure is 180/120 mmHg. On dilated examination, you find numerous exudates, flame-shaped hemorrhages, cotton-wool spots, and severe attenuation of the arterioles. You do not find AV crossing changes, and the arteriolar light reflex is normal.

➤ **What information does your ophthalmoscopic examination provide about the chronicity of the patient's systemic hypertension?**

Answer

Flame-shaped hemorrhages and cotton-wool spots are ophthalmoscopic changes indicative of acute, severe hypertension. When these features occur in the absence of arteriolar sclerotic changes (i.e., AV crossing phenomenon), the hypertension is most likely of recent onset.

In such cases, hypertension may be associated with renal insufficiency, encephalopathy, and impairment of cardiac function. Controlled reduction of blood pressure should be initiated immediately.

35. A previously healthy 40 year-old woman presents with bilateral proptosis and lid retraction, but she denies any pain.

- **The most likely diagnosis is:**
- a. Metastatic tumor to orbit.
 - b. Orbital cellulites.
 - c. Orbital pseudo tumor.
 - d. Thyroid eye disease.
 - e. Carotid artery-cavernous sinus fistula.

Answer

d. Thyroid eye disease is the most common cause of unilateral or bilateral proptosis in adults. Thyroid eye disease can be present with normal thyroid function. Orbital pseudotumor usually causes pain, whereas thyroid eye disease does not. Orbital cellulitis usually presents with swollen, tender, erythematous lids, malaise, and elevated white blood cell count. Carotid cavernous sinus fistula causing proptosis is more common following trauma and is not associated with lid retraction, and often a bruit can be auscultated with the stethoscope over the orbit. Metastatic tumor of the orbit would not likely be bilateral with a negative past medical history.

36. A busy student comes to you during exam week because she is experiencing severe headaches. As part of a complete physical, you perform a basic eye examination. During ophthalmoscopy you cannot fully see the optic disc because the patient's pupil is very small. You find no contraindications to dilating the pupil so you decide to do so to facilitate ophthalmoscopy. Your patient is brown-eyed, 20 years old, and has no other health complaint.

- **Which of the following drugs would you select to dilate the pupils?**
- a. Phenylephrine hydrochloride 0.12%.
 - b. Phenylephrine hydrochloride 2.5%.
 - c. Phenylephrine hydrochloride 10%.
 - d. Atropine sulfate 1%.
 - e. Tropicamide plus phenylephrine hydrochloride 2.5%.

Answer

e. The patient is experiencing severe headaches. A potential source of these headaches is increased intracranial pressure due to brain tumor, with resultant papilledema. Therefore, it is important to see the optic disc clearly to examine for these findings. Phenylephrine hydrochloride 2.5% may not be effective when used alone as a mydriatic in a brown-eyed patient. Atropine sulfate 1% is never used for simple pupillary dilation because its effects may last 1 to 2 weeks. The 0.12% solution of phenylephrine is the strength found in many over-the-counter ocular decongestants and will dilate the pupil minimally. The 10% solution is not the preferred concentration because it may be associated with serious systemic side effects in certain individuals. A combination of tropicamide with phenylephrine 2.5% usually provides excellent pupillary dilation with a relatively short duration of action and minimal systemic risk.

37. A man who has recently moved to the area is referred to you by a friend. He reports feeling especially tired lately becoming fatigued after only moderate activity. He is also concerned about his vision; everything seems "dingy" or "yellow" to him. He's not sure when this visual symptom started. The patient has a history of heart disease, for which he takes cardiac medications. Examination reveals no health problems, other than his heart condition, which appears stable.

- **How would you treat this patient? Should you refer him to an ophthalmologist at this time?**

Answer

Symptoms of blurred vision or abnormally colored vision occur with digitalis intoxication. Fatigue and weakness are also characteristic. Usually, such symptoms occur only with overdosage and resolve with reduction of dosage or discontinuation of the drug. Because no other health problems exist, it is reasonable to attribute his symptoms to digitalis intoxication. The step to take in this case is to measure the digitalis level in the blood and, if elevated, reduce the dose of digitalis. The patient should be monitored until the visual symptoms and fatigue are eliminated. Referral to an ophthalmologist is not necessary if the visual symptoms resolve.

38. A 25 year-old man makes an appointment to see you for complaints of difficulty breathing that developed after an injury. While playing basketball, he was knocked to the floor and struck his head. He went to the emergency room, where the only problem noted was a small hyphema in the right eye. He was seen by an ophthalmologist, who subsequently saw the patient for a return visit and instituted a pressure drop in the injured eye. The next day he developed shortness of breath and wheezing, and he asked to see you as he feared he may also have injured his chest when he fell. He thinks his parents told him he once had a brief episode of asthmatic bronchitis as a child, but he had previously felt this was not worth mentioning, as the condition required no chronic follow-up or therapy.

- What other history might be helpful for you in evaluating this patient's current symptoms? Would consultation with the ophthalmologist be necessary?

Answer

The onset of symptoms suggestive of asthma or other obstructive airway disease after institution of an ocular anti-hypertensive drop should make the clinician highly suspicious that the patient has been placed on a topical beta-blocker. Systemic absorption of either selective or nonselective drops in this class may be sufficient to cause significant contraction of bronchial smooth muscle, especially in asthmatics. The ophthalmologist should be contacted to determine the exact ocular medication regime and to inform him or her about the development of the side effects. The topical beta-blocker should be discontinued immediately, but because the intraocular pressure could subsequently rise to a dangerous level, the ophthalmologist should be consulted to determine if further ocular assessment or alternative drop therapy is advised.

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